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# PHILOSOPHICAL TRANSACTIONS.

*Munday Septemb. 9. 1666.*

## The Contents.

*Observations made in several places ( at London, Madrid and Paris,) of the late Eclipse of the Sun, which hapned June 22. 1666. Some Enquiries and Directions, concerning Tides, proposed by Dr. Wallis. Considerations and Enquiries touching the same Argument, suggested by Sir Robert Moray. An Account of several Books lately publish'd : Vid. 1. Johannis Hevelii Descriptio Cometæ, A. 1665. exorti ; una cum Mantissa Prodro- mi Cometici. 2. Isaacus Vossius de Nili & aliorum Flumi- num Origine. 3. Le Discernement du Corps & de l'Âme, par Monsieur de Cordemoy.*

Observations made in several places, Of the late Eclipse of  
the Sun, which hapned on the 22 of June, 1666.

THE Observations that were made at London by Mr. Willughby, Dr. Pope, Mr. Hook, and Mr. Philips, are these :

The Eclipse began at 5h. 43'		h.	
It was dark- ned.	$\frac{1}{2}$ diam. _____ at 6. 00	5 dig. _____ at 7. 06	
	4 digits _____ at 6. 07	4 dig. _____ at 7. 13	
	5 dig. _____ at 6. 13	3 dig. _____ at 7. 20	
	6 dig. _____ at 6. 21	2 dig. _____ at 7. 26	
	7 dig. _____ at 6. 39 $\frac{1}{2}$	1 dig. _____ at 7. 32	
	6 dig. _____ at 6. 57	0 dig. _____ at 7. 37	

Its Duration hence appears to have been one hour and 54 m. Its greatest Obscurity somewhat more than 7. digits. About the middle, between the Perpendicular and Westward Horizontal Radius of the Sun, viewing it through Mr Boyle's 60. foot-Telescope, there was perceived a little of the Limb of the Moon without the Diske of the Sun : which seemed to some of the Observers to come from some shining Atmosphere about the Body either of the Sun or Moon.

They affirm to have observ'd the Figure of this Eclipse, and measured the

R Digits

*Digits*, by casting the *Figure* through a 5 foot *Telescope*, on an extended paper, fix't at a certain distance from the Eye-glasse, and having a round figure; all whose *Diameters* were divided, by 6 *Concentrick* Circles, into 12 *Digits*.

THE Observations made at *Madrid* by a Noble Member of the *Royal Society*, His Excellence the Earle of *Sandwich*, as they were sent to the Right Honourable, the Lord Vice-Count *Bronnker*, are these;

The Eclipse began at *Madrid* about 5 of the Clock in the morning, at 5 h. 35'. the Suns *Altitude* was 6 deg. 55'.

The *Middle* of it was at 6 h. 2'. the Suns *Altitude*, 15. deg. 5'.

The *End* was exactly at 7 h. 5'; the Suns *Altitude*, 25. deg. 24'.

The *Duration*, 2 h. 4'.

37. Parts of the Suns diameter remained light.

63. Parts of the same were darkened.

THE Observations made at *Paris* by Monsieur *Payen*, assisted by several *Astronomers*, as they were printed in *French*, and addressed to Monsieur de *Montmor*, are these;

The Eclipse began there, at 5 h. 44'. 52". *mane*. It ended at 7 h. 43'. 6". So that its *Whole Duration* was 1 h. 58'. 14". The *greatest Obscuration* they assign to have been 7. dig. 50. m. but they adde, that it seem'd to have been greater by 3 minuts; which M. *Payen* imputes to a particular motion of *Libration* of the Suns Globe, which entertain'd that Luminary in the same *Phasis* for the space of 8. min. and some *seconds*, as if it had been stopped in the midst of its Course; rather than to a tremulous Motion of the *Atmosphere*, as *Scheiner* would have it.

They intimate that they took the time of each *Phasis* from half *digit* to half *digit*, as well by a *Pendulum*, as by the *Altitudes* of the Suns Center above the *Horizon*, corrected by the *Verticall Paralaxes* and *Astivall Refractions*, by which they judged, that though the Time by the *Pendulum* may be sufficient for *Mechanicall* Operations, yet 'tis not exact enough for establishing the *Gröunds of true Astronomy*.

They further conceive that the apparent *Diameters* were almost equal; seeing that in the *Phasis* of 6. *Digits*, the *Circumference* of the *Moons disk* passed through the Center of that of the *Sun*, so as that two Lines drawn through the two *Horns* of the *Sun*, made with the *Common Semi-diameter* two *Equilateral Triangles*.

Next, they affirm, That there was so great a Variation in the *Parallaxes*, by reason as well of the *Refractions* of the Air, which environs the Earth, as of the Alteration of the Air, which encompasses the Moon, that the *Horns* of the *Sun*, there formed by the Shaddow of the Moon, appeared in all kinds of *Figures*; Sometimes inclined to the *Vertical*, sometimes *Perpendicular* to the *Horizon*, and at last *Parallel*; the *Convex* part respecting the *Heaven*, and the *Concave*, the *Horizon*. By the crossing (so they go on) of the  
Horns

*Horns* with the *Angles of Inclination*, it will be easie to those, that have exactly observed them, and that are skill'd in the higher *Astronomical* Calculations, to compute the true Place of the *Moon* in her *Orbite*, that so it may be compared with that of the *Tables*, and with that, which has been observ'd in other places, for the more precise determining of the *Difference of Meridians* (that being the way, esteem'd by *Kepler* the most certain) and for making a good Judgment of the defect or exactness of the *Celestial Tables*.

Then they observe, That the *Beginning* and the *Middle* of this *Eclipse* hapned to be in the *North Eastern Hemisphere*, and the *End*, in the *South-Eastern*. The *first Contact* (as 'twere) of the two *Disks* was observ'd in the *Superior Limb* of the *Sun's Disk* in respect to the *Vertical Line*, and in the *Inferior* in respect to the *Ecliptick*: But the *Middle*, and the *End* were seen in the *Superior Limb*, in respect both to the *Vertical* and the *Ecliptick*: And (what to this Author seems extraordinary) both the *Beginning* and the *End* of this *Eclipse* hapned to be in the *Oriental* part of the *Sun's Disk*.

Lastly, they take notice, that by their *Observations* it appears, that there is but little exactness in all the *Astronomical Tables*, predicting the *Quantity*, *Beginning* and *Duration* of this *Eclipse*; Those of *Lanibergins* importing, That the *Obscuration* should be of 10. dig. 48'; those of *Ricciolo*, of 9. dig. 1'; and those of *Kepler*, of 7. dig. 30'. 16": Again, that the *Duration* should be of 2 h. 2'. Lastly, The *Beginning* did anticipate the *Ricciolan Tables* by 5. minuts; the *End* by 23; and the *Middle*, almost by 11. In the mean time the Author notes, that the *Rudolphin Tables* come nearest to the *Truth*; and withal assures the *Reader* of the goodnesse of the *Instruments* employed in his *Observations*, and of the singular care, he, together with his skilful *Assistants*, took in making them.

*Some Inquiries and Directions concerning Tides, proposed by Dr. Wallis, for the proving or disproving of his lately publish'd Discourse concerning them.*

The Inquisitive Dr. *Wallis*, having in his lately printed *Hypothesis* of *Tides* intimated, that he had reason to believe, that the *Annual Spring-tides* happen to be rather about the beginnings of *Febr.* and *Nov.* than the two *Equinoxes*, doth in a late Letter to the *Publisher*, written from *Oxford* in *Aug.* last, desire, *(Sea)* some understanding Persons at *London*, or *Greenwich*, but rather nearer the ~~that~~ or upon the *Sea-shore*, would make particular *Observation* of all the *Spring-Tides* (*New-Moon* and *Full-Moon*) between this and the *End of November*; and take account of the *Hour*, and of the *Perpendicular height*: that we may see, whether those in *September*, or those of *November* be highest: And it were not amiss, the *Low waters* were observed too. Which may be easily done by a mark made upon any standing *Post* in the *Water*, by any